DOCUMENT RESUME

ED 362 499 SP 034 763

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TITLE When Words Are Worth More Than a Thousand Numbers: The Power of Qualitative Research Procedures in Evaluating the Impact of Educational Programs & Practices.
PUB DATE Nov 92
NOTE 18p.; Paper presented at the Annual Meeting of the National Council of States (17th, San Diego, CA, November 20-24, 1992).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Affective Measures; Data Analysis; Data Collection; Educational Practices; Educational Research; Ethnography; *Evaluation Research; Higher Education; *Program Evaluation; *Qualitative Research; Research Design; *Research Methodology; Social Science Research; Statistical Analysis

ABSTRACT

Research practitioners have traditionally collected and analyzed data using experimental designs and inferential statistical procedures. In addition to being difficult to learn and apply, these quantitative procedures generally leave out such variables as attitudes, feelings, and emotions. This paper describes the nature and role of qualitative data collection and analysis procedures in the context of evaluation research or impact assessment. This method is often used by social service professionals to determine if a given program, process, or procedure has worked; focusing only on readily quantifiable outcomes would appear to leave out quite a few essential social and behavioral elements. The document provides a framework for discussing the two complementary aspects of impact assessment, process and outcome, and relative strengths and functions of quantitative versus qualitative procedures. Following this discussion, several commonly applied qualitative procedures are identified, the power of combining numbers and words in the form of multimethod research designs is explained, and their applications are illustrated in a variety of actual evaluation studies. (Contains 23 references.) (LL)

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ED 362 499

WHEN WORDS ARE WORTH MORE THAN A THOUSAND NUMBERS

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The Power of Qualitative Research Procedures in Evaluating the Impact of Educational Programs & Practices

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Paper presented to:

The National Council of States
17th Annual National Conference
San Diego, California

November 20 - 24, 1992

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Introduction

At some point, all research practitioners and students come face to face with needing to acquire the necessary "tools of the trade" to collect and analyze their data. Traditionally this has been done in the form of experimental designs and inferential statistical procedures.

Also, as those researchers who have "survived" a methods course would probably admit, these quantitative procedures are generally considered difficult to learn and apply. However, the precision, concise format (e.g., readily compilable as tables, charts and graphs) and statistical generalizability of these numbers have, for most users, seemed to justify any "pain" of learning them.

Recently, however, a number of researchers have taken a careful look at what these numerical tools are actually telling them and have found quantitative procedures sadly lacking. In particular, such inherently interesting and often critical variables as attitudes, feelings and emotions have been stripped of much of their meaning and value to the researcher when subjected to often-artificial quantification.

This would seem to be a material omission of information needed to address one's research question -- particularly in the case of evaluation research designs. As defined by Rossi & Freeman (1989), " ... evaluation researchers (evaluators) use social research methodologies to judge and improve the ways in which human services policies and programs are conducted, from the earliest stages of defining and designing programs through their development and implementation (p. 18)." As Kettner, Moroney & Martin (1990) point out, "Designing effective programs requires that social service professionals develop a more thorough understanding about *social problems*, *people in need*, and social services than has been expected in the past (p. 14, emphasis ours)." In order to accomplish such objectives of a valid and holistic impact assessment, focusing only on readily quantifiable outcomes would appear to leave out quite a few essential social/behavioral elements.

The purpose of this paper is to describe the nature and role of qualitative data collection and analysis procedures in the context of evaluation research. A brief overview of the two complementary aspects of impact assessment will be provided. Next, the different relative strengths and functions of quantitative vs. qualitative procedures will be described. Following this discussion, several commonly applied qualitative procedures will be identified. Next, the power of combining numbers and words in the form of multimethod research designs will be explained, and their application illustrated, in a variety of actual evaluation studies completed by the two authors.

"Did It Work?" The Key Question of Evaluation Research

The driving force of evaluation research, or impact assessment, is to see if a given program, process or procedure "worked." As a number of prominent evaluation researchers (Kettner, Moroney & Martin, 1990; Patton, 1990; Berk & Rossi, 1990; Rossi & Freeman, 1989) have pointed out, however, the answer to this question is really made up of two distinct parts:

1. Was the program, process or procedure executed *according to plan*?
2. Did the program, process of procedure *lead to the desired outcomes*?

It is critical to note the difference between these two questions. A program can indeed "run by the numbers" and yet fail to produce the target outcomes for which it was designed. In this regard, the "medical model" provides one such example. The patient may be following his/her prescription to the letter and yet fail to recover from illness. The solution, in both the medical and evaluation model cases, is to "change the prescription" so as to improve the chances of "attaining good health."

Kettner, Moroney & Martin (1990) refer to these distinct aspects or phenomena as "theory failure," vs. "program failure (p. 191)." Berk & Rossi (1990) employ the terms "effectiveness (p. 54)," vs. "program integrity (p. 66)."

Process and Outcome: Two Distinct Evaluation Dimensions

Regardless of the particular label, it is essential to distinguish between such "process" and "outcome" aspects of program evaluation. Packard (1992) has referred to the former phenomenon as " ... teachers dancing in the classroom." Such a teacher can indeed 'go through the motions' of his/her behavioral-objective evaluation checklist and earn high ratings on all of the process criteria without any corresponding look at whether these activities are in fact leading to the desired outcome of increased student academic achievement. If the mere activity gets confounded with, or even worse substituted for, the target outcome(s) it was originally designed to attain, then the evaluation activity has badly missed its mark. In an often-quoted maxim regarding financial reporting, "The only things that count are the things that get counted." While such prespecified "process" activities (e.g., number of times a teacher positively reinforced a student's response in a remedial reading tutorial intervention) often rather conveniently lend themselves to such numerical tallying and compilation, the danger lies in neglecting to measure the desired outcomes that these process activities were designed to achieve. In particular, certain of these outcomes may elude quantification -- yet may also be critically desired objectives

(e.g., did students acquire a more positive attitude about reading? and greater self-esteem with regard to their reading skills?)

The Lure of Numbers: Precision at What Price?

Part of the blame for such a misguided "tallying mentality" approach to evaluation research belongs to the overglorified image of quantitatively expressed information. Granted, numbers seem to be focused, precise and readily manipulable. As Patton (1990) indicates, "Numbers convey a sense of precision and accuracy even if the measurements that yielded the numbers are relatively unreliable, invalid and meaningless (p. 479)." Furthermore, as stated by Dereshiwsky (1992), "It's a sad fact that the unknown (and therefore scary) is sometimes also given undue glory and prominence. I've seen this phenomenon at work with respect to statistics ... and statisticians (p. 5)."

Indeed, when properly applied, statistics may tell us a great deal. The problem lies in using them for the wrong purpose, as well as in failing to recognize what these elegantly simplistic statistics are NOT able to tell us.

Elliot Eisner (1991) illustrates the differential benefits of numbers vs .words (e.g., quantitative vs. qualitative data) in his colorful metaphor of the fox and the hedgehog. The fox runs far and fast and covers a vast expanse of ground. However, in doing so its paws barely skim the surface. This is analogous to using quantities and inferential statistics to generalize a rather limited set of values (e.g., test score averages) "with 95% confidence" to thousands of cases. At first glance the fox may seem superior to the hedgehog in terms of speed or surface covered. However, it is easy to forget that while the hedgehog stays within a much smaller absolute area of ground, it (unlike the fox) can burrow deep. As it does this, it gets a rich, closeup view of a wide variety of layers of earth, plants, bugs, all of which make up the supporting structure to that surface. The hedgehog's view is analogous to collecting and analyzing qualitative data.

Yin (1989) has referred to the distinction between quantitative and qualitative data analysis purposes as "statistical" and "analytic" generalization, respectively. Qualitative data allow for an in-depth understanding of the key ingredients contributing to success or failure of the program being evaluated -- as opposed to a single, perhaps overly summarized numeric indicator. As elaborated by Yin (p. 21):

> ...Case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes. In this sense, a case study, like the experiment, represents a "sample," and the investigator's

goal is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization).

An evaluation researcher may, like the hedgehog, wish to "stay in a single spot" and assess only a single locally based program, process or procedure. He or she may have no need or desire to compare this one intervention to other, similar programs in distant sites and with vastly different types of program participants. That activity can come later with multiple replications and extensions of the study; e.g., "cross-case analysis" (Yin, 1989). But for the time being, a single program is being assessed as to its effectiveness for its locally based key stakeholders. In order to do so validly, the evaluation researcher will want to collect data on the program from a variety of program and participant perspectives. This is precisely where the versatility and context of qualitative data collection and analysis come into play.

The Power of Words: Rich and Revealing

Denzin (1978), Marshall & Rossman (1989), and Patton (1990), among other qualitative researchers, have consistently pointed out how simple, and yet wondrously complex, words can be. Learning to collect and analyze qualitative data requires relatively little training, as compared with inferential statistical procedures (and, often, related computer programming skill). Yet for all its surface simplicity, a quotation can be tremendously revealing in terms of its wording, content, examples, detail and the like.

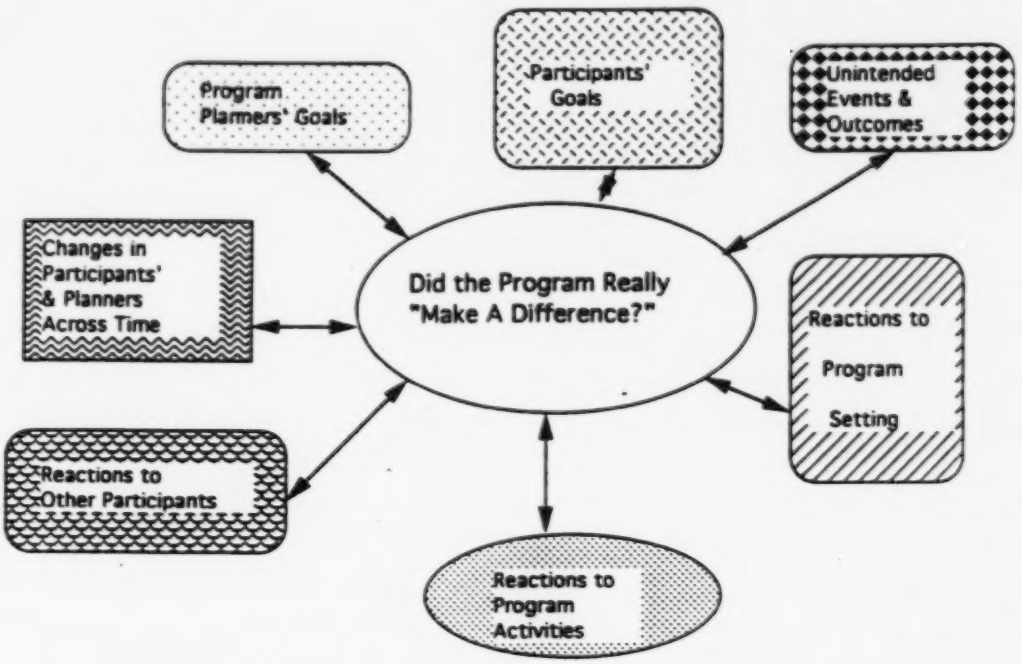
As ethnographers have known for quite some time, there is nothing quite like letting subjects "tell a story in their own words." In doing so, the evaluation researcher gains a valuable peek into the "world" of the key stakeholder and the full impact of the program as he/she lived and experienced it from a unique and personal perspective. This would include the often unquantifiable, and yet critically success-related, factors such as attitudes, emotions, feelings, and perceptions. (Packard & Dereshiwsky (1992) have provided a comprehensive listing of such key organizational climate variables.) Any and all factors related to program impact need to be explicitly recognized, and their influence scientifically assessed, in order to accomplish a complete and content-valid evaluation of the full impact of a program, policy or activity.

Figure 1 (page 5) depicts the assessment of multiple facets of such a program. As can be seen from this figure, the different graphically displayed 'layers' are analogous to the sorts of multiple perspectives (key stakeholders, setting, objectives, and outcomes), all of which need to be carefully considered in gauging the effectiveness of program impact.

Each of these factors can also be evaluated using a variety of qualitative data collection procedures.

Figure 1.

The Importance of Context in Evaluation Research


Program Planners' Goals
Participants' Goals
Unintended Events & Outcomes
Changes in Participants' & Planners Across Time
Did the Program Really "Make A Difference?"
Reactions to Program Setting
Reactions to Other Participants
Reactions to Program Activities

Strategies for Collecting and Analyzing Qualitative Data

Qualitative data collection and analysis procedures have recently gained a long-overdue scholarly and scientific recognition in the educational and evaluation research communities. As documented in a number of recent sources (Marshall & Rossman, 1989; Krueger, 1988; Denzin, 1989; Patton, 1990), some commonly accepted ways to collect data in words include the following:

1. focus group interviews;
2. individual in-depth interviews;
3. participant obser vation;
4. archival document content analysis;
5. proxemics and kinesics (e.g., 'body language' and spatial arrangements of setting);

6. unobtrusive measures (e.g., collecting and analyzing artifacts).

Equally simple procedures have been developed to compile the results of such data collection in words. Until recently, a major barrier to qualitative data analysis has been lack of parsimony in presentation. That is, it was feared that the only way to report such data would be to reproduce voluminous reports of page after page of verbatim quotes -- with the attendant concern that no one would ever bother to read a report of that length. In contrast, the world of statistics was rather 'envied' for its succinct pattern of presenting numeric findings in the form of tables, graphs and charts. That all changed in 1984 with the development of a procedure by Miles & Huberman known as the "matrix" or "table-shell" method. The authors creatively proposed a pictorial way to represent summary patterns, themes or trends in qualitative data that often takes no more than a page or two to"tell the story at a glance."

A second popular way to report qualitative data is the "summary narrative method" (Denzin, 1989; McCracken, 1988). This presentation style concisely interweaves summary narrative with a sprinkling of key illustrative quotes to present key themes in a more manageably readable way.

"Having the Best of BOTH Worlds:" Combining Words with Numbers

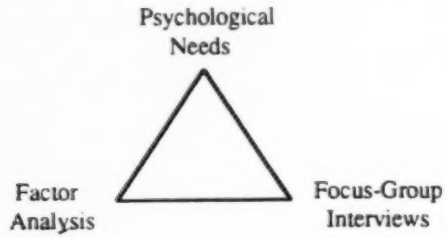
Given the differential strengths and insufficiencies of quantitative vs. qualitative data, it is natural to want to attain the best of both procedures in a given evaluation study. In fact, this is a relatively new and exciting branch of research methodology known as "multimethod research." As pointed out by Brewer & Hunter (1989), "Its fundamental strategy is to *attack a research problem with an arsenal of methods that have nonoverlapping weaknesses in addition to complementary strengths* (p. 17, emphasis in original text)." This convergence, or comparison from multiple perspectives, has also been referred to as "triangulation" by a number of prominent research sources (Denzin, 1978; Jick, 1979). As elaborated in Brewer & Hunter (1989, p. 17):

> Broadly speaking, measurement is the operation of assigning either qualitative or quantitative values (that is, either names or numbers) to social phenomena. Triangulated measurement tries to pinpoint the value of a phenomenon more accurately by sighting in on it from different methodological viewpoints. To be useful, a measuring instrument must both give consistent results and measure the phenomenon that it purports to measure. When two reliable instruments yield conflicting results, then the validity of each is cast into doubt. When the findings of different methods agree, we are more confident.

Figure 2 (p. 7) depicts a triangulation of quantitative and qualitative measurement procedures (Packard & Dereshiwsky, 1992). Please note that the critical element is not the three specific measurement processes; rather it is the application of a variety of alternative data collection and analysis procedures to see if they "point in the same direction" regarding program impact and assessment.

Figure 2.

Triangulation of Data from Basic Psychological Needs,
Factor Analysis & Focus-Group Interviews



Multimethod research design and analysis procedures have been applied by Packard & Dereshiwsky to a variety of evaluation research activities. One such study constituted the pilot test of a picture booklet designed for use with Navajo families identified as "at risk" for developing diabetes (1991). Figure 3 (p. 8) displays the triangulation and convergence of findings regarding this booklet from three alternative strata of interview subjects: program administrators; interviewers; and diabetes health educators.

Figure 4 (p. 9) contains a matrix reporting results of a preliminary qualitative needs assessment conducted in partnership with a private high school located in a southwestern reservation community. As can be seen from this matrix, participants' comments were summarized and clustered according to their current professional affiliation (e.g., faculty, staff, administrator, parent, student). Thus the reader can readily compare whether different key stakeholders had different perceptions. A conceptual model depicting the key components of this organization (which in turn became the integral aspects of the holistic needs assessment and appear as columns of the matrix) appears in Figure 5 (p. 10).

Figure 3.

Triangulation of Pilot-Test Results from Three Key Stakeholder Strata of Subjects:
A Diabetes Educational Material Needs Assessment

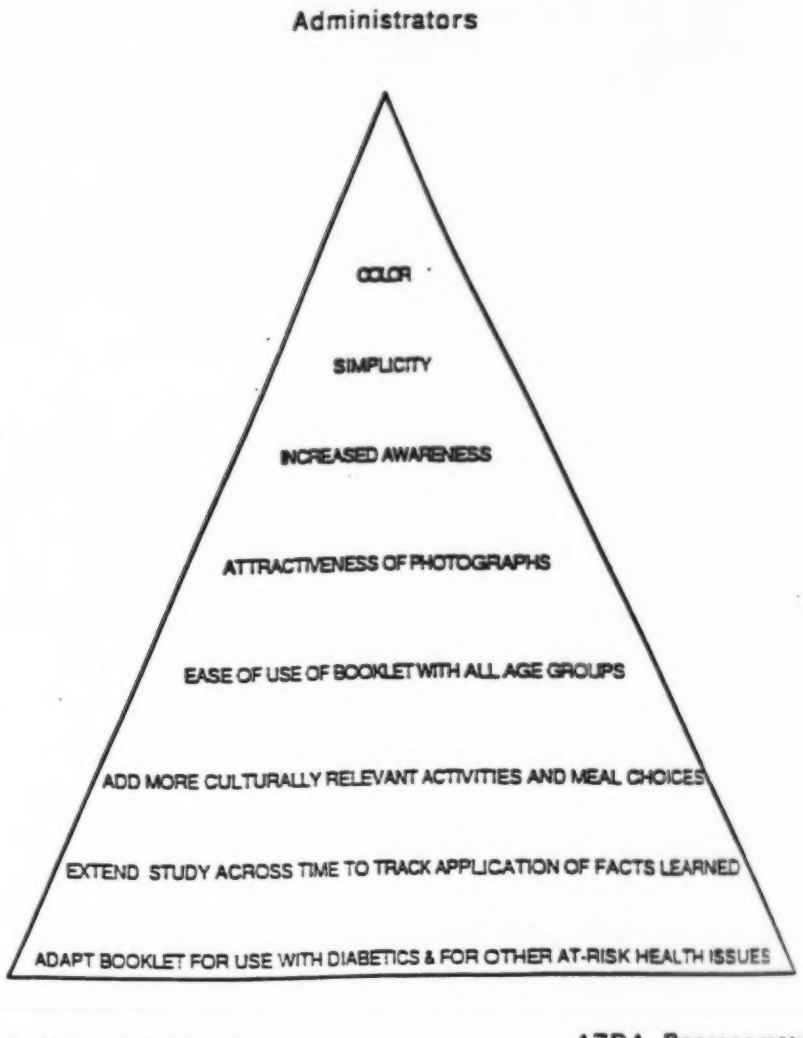

Administrators
COLOR
SIMPLICITY
INCREASED AWARENESS
ATTRACTIVENESS OF PHOTOGRAPHS
EASE OF USE OF BOOKLET WITH ALL AGE GROUPS
ADD MORE CULTURALLY RELEVANT ACTIVITIES AND MEAL CHOICES
EXTEND STUDY ACROSS TIME TO TRACK APPLICATION OF FACTS LEARNED
ADAPT BOOKLET FOR USE WITH DIABETICS & FOR OTHER AT-RISK HEALTH ISSUES
Volunteer Interviewers
AZDA Representatives

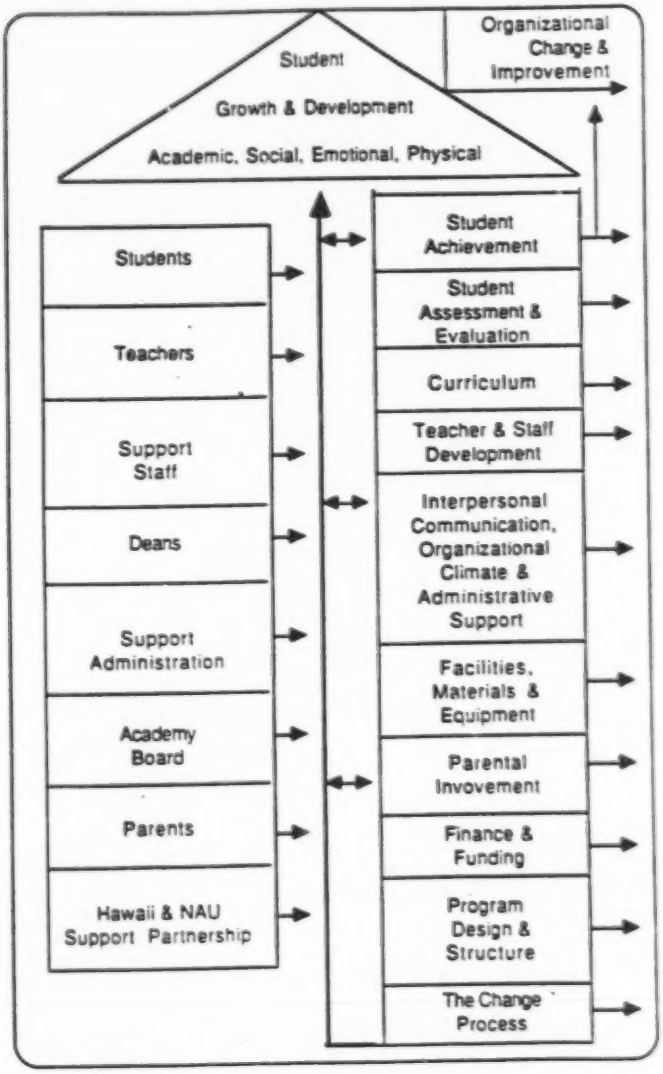
Figure 4.

An Example of Matrix Reporting of Qualitative Interview Data: Key Stakeholder Strata Comments for Key Organizational Components of a School System

Group	Curriculum	Teacher and Staff Development
Students	• No comments	• Teachers need to help individual students
Teachers	• Need facilities, materials and equipment • Need integration between and across areas	• Need help to assess student progress • Improved orientation inservice • Feelings of isolation
Support Staff	• No comments	• Teachers need to help individual students • Need valid and reliable evaluation system
Deans	• Focus on higher-level learning skills (patterns and processes) • Integrate cultural activities into curriculum	• Teachers need to help individual students • More facilities, materials and equipment • Improved orientation inservice
Support Administration	• No comments	• Teachers need to help individual students • Extracurricular activities beneficial
Academy Board	• Curriculum is well spelled out • Had input into curriculum	• Teachers need to help individual students
Parents	• No comments	• Teachers need to help individual students • Need help to assess student progress

Figure 5.

A Holistic Organizational Assessment, Planning and Improvement Model
Used in a Needs Assessment
of a School System



Additionally, Packard & Dereshiwsky have developed a data analysis procedure known as "profiling." This procedure combines both words and numbers by tallying the net frequency of mention of a given idea or concept. In the case of an organizational component being evaluated, if the number of positive mentions exceeds that of negative mentions, that component may be assumed to be currently functioning at a "healthy" operational level. On the other hand, if the negative tally outweighs the positive, then that component is functioning "below par" and needs immediate attention or remediation.

This profiling procedure is depicted in tabular form with respect to student achievement for the various key stakeholder groups in Figure 6 (p. 11). Figure 7 (p. 12) contains a graphical depiction of the profiling procedure as applied to the organizational "support factors" participating pilot-test districts of the Arizona Career Ladder Program (Packard and Dereshiwsky, 1989). Please note that those components pictured below the baseline are considered to be functioning at "relatively unhealthy" levels, and vice versa. (A similar table was generated for the organizational "focus factors;" please see Packard and Dereshiwsky, 1989, for additional details.)

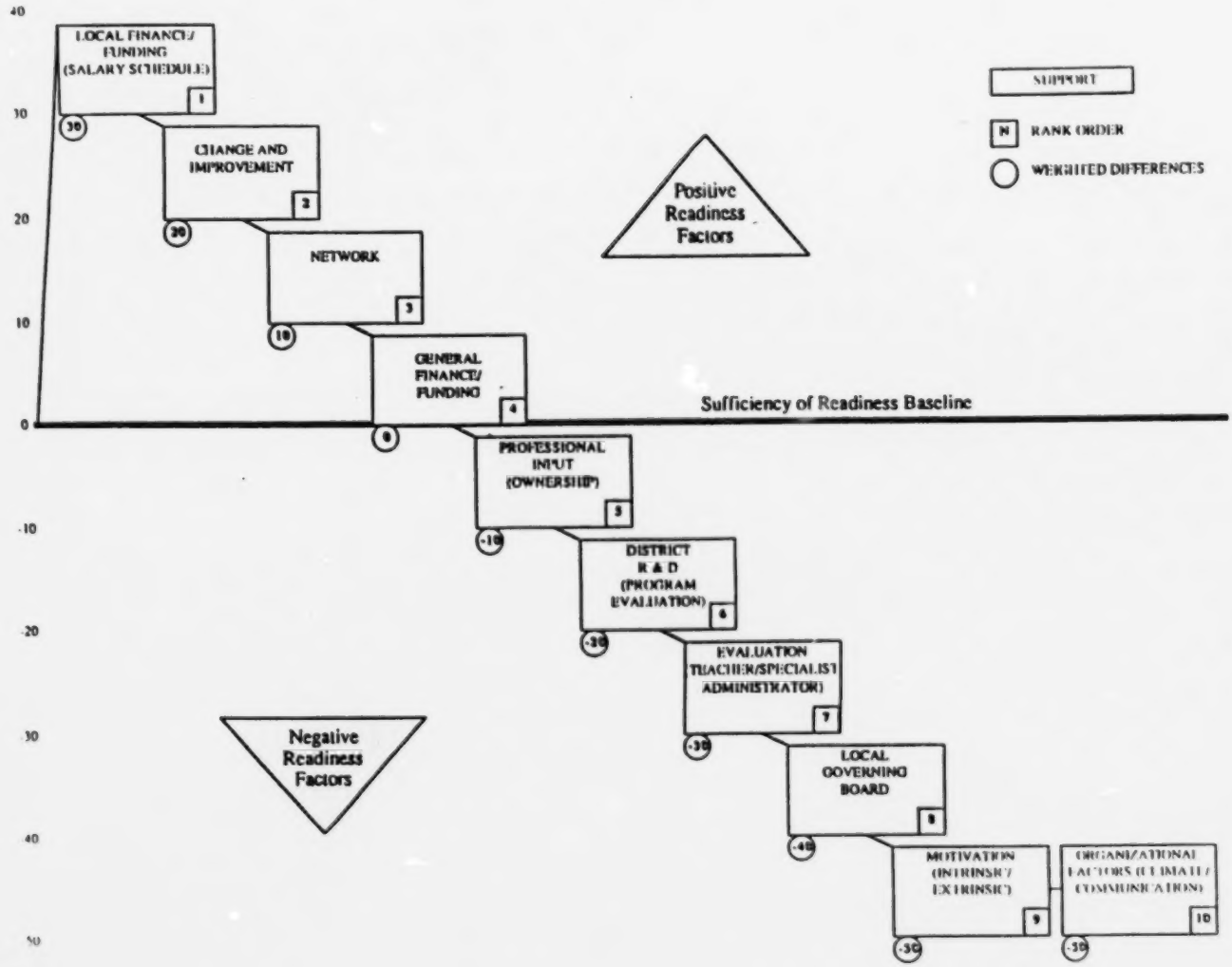
Figure 6.

An Example of Converting Qualities to Quantities:
Relative Frequency of Positive and Negative Comments about Student Achievement
by Key Stakeholder Strata

Group	Positives	Negatives	Net Subtotal
Students	1	25	-24
Teachers	3	18	-15
Support Staff	8	14	- 6
Deans	4	2	+ 2
Support Administration	1	6	- 5
Academy Board	1	19	-18
Parents	1	7	- 6
Hawaii & NAU Support Partnership	5	13	- 8
		Subtotal	-80

Figure 7.

Organizational Readiness Profile of Relative Strengths & Insufficiencies:
Support Factors



Concluding Comments

Longtime residents of the Northeast will recall a certain colorful ex-mayor of New York City and his habit of stopping citizens on the street and asking them rather directly, "How am I doing?!" As one can imagine (and this ex-mayor undoubtedly discovered in very short order), this question is both basic and complex in its nature. Responses may run the gamut from the courteously noncommittal, "Fine," all the way to a detailed laundry list of kudos or complaints.

By its very focus on this key issue, evaluation is arguably the most "universal" and versatile of research methodologies. It is difficult to imagine any branch of human endeavor that does not involve some sort of improvement-oriented "intervention" and a corresponding desire to assess its impact -- be it in such diverse areas as medicine, economics, or education.

Traditional quantitative approaches have shown only one side of the picture -- and, unfortunately, in some cases a rather limited one at that. The astute evaluation researcher desiring to attain a more balanced, comprehensive and above all *valid* assessment would be well advised to consider application of qualitative procedures. By balancing the *generalizability* of the numbers with the *contextual richness* of the words, the evaluator will attain a more balanced, rich and in-depth perspective as to the entire range of strengths, insufficiencies and recommendations for improvement.

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